ET-103

May 1937

United States Department of Agriculture
Bureau of Entomology and Plant Quarantine

A MOBILE ENTOMOLOGICAL LABORATORY [1]

By L. D. Christenson and William F. Turner

The laboratory described herein was designed and equipped for the purpose of carrying on a survey of insects in peach orchards. A mobile unit was necessary because the project called for a study of widely separated areas within a single season. In each area, laboratory facilities were needed and appropriate means for handling and studying collected specimens were also essential. The requirements of the survey seemingly could not be met satisfactorily in any other way.

Inasmuch as a qualitative study of the soil insect fauna was to be made in each widely separated region, it was important that as many Berlese funnels as possible be carried in the laboratory. For this reason the placement of these funnels was given primary consideration and all other furnishings and equipment were built in secondarily. However, after several months of actual use in the field, it is evident that a mobile laboratory would be equally adapted to many other types of field work. The funnels might be replaced by controlled-temperature apparatus for use in cases where material to be treated or tested cannot be readily brought to a laboratory. Again, it might be devoted to the placement of special apparatus needed in conducting trap-light experiments in areas not accessible to commercial current. In case considerable amounts of current are not needed, a much smaller electric plant might be used -- possibly installed in the trailer itself -- and the space taken up by the funnels in the trailer, as described, could be used for breeding cages of almost any type, or for other special apparatus that might be needed for distributing parasites, for rearing insects, for preparing and testing insecticides, etc. While the space is limited, with a little study almost any type of laboratory installation on a restricted scale can be made.

The present laboratory is a 16-foot cabin trailer of commercial make, which provides a maximum inside length of 14½ feet and a maximum inside width of 6 feet. It has a rear door in addition to the regular door on the right side. The rear door is now being used only for ventilation, and it is felt that such a specification is not essential.

Eight Berlese funnels have been installed in the trailer. Five of them are located in the back of the trailer and three of them are situated along

---

[1] A contribution from the Division of Fruit Insect Investigations.

the left side wall, just ahead of the wheel housing. This arrangement of funnels proved to be the most expedient one for the trailer obtained. In other trailers other arrangements may prove to be more suitable.

The Berlese funnels 2/ used in the trailer are of the type described in ET-81. They serve as a means of separating soil insects and other arthropods from the soil. Certain constructional changes have been made in them so that a stronger funnel, more capable of withstanding almost constant transportation, has been achieved. The galvanized tin legs of the funnels described in ET-81 have been supplanted by a tripod of three strong angle-iron legs. A brace in the form of a $\frac{1}{4}$-inch iron rod runs from each leg to an iron ring which encircles the lower end of each funnel. The lower ends of the legs have been flattened and then angled outward so as to rest flat on the floor. When these protruding flat ends of the legs have been drilled, a means of securely bolting the funnels to the floor of the trailer results. The capacity of the funnels has also been increased so as to accommodate larger soil samples. The soil containers used in the mobile laboratory are 14 inches in diameter. The total length of the funnels used has been reduced to approximately 4 feet so as to allow ample room for loading and unloading within the trailer.

The wheel housings of the trailer are 35 inches long, 15 inches wide, and 18 inches high. They are constructed of metal and are sufficiently rigid so that it has been possible to build cabinets on them. On one of the wheel boxes a five-drawer chest to carry equipment has been constructed. Over the other box a five-shelf closet has been built.

At the front end of the trailer another storage cabinet has been made. It is 22 inches wide at its greatest width and rises from the floor to a height of 28 inches. This cabinet varies in width because the trailer narrows obtusely to a point at its front end. On the flat top of this cabinet a galvanized iron sink, 10 inches by 16 inches by 4 inches deep, has been installed. The outlet for the sink is carried through the storage space below and out through the floor of the trailer.

A water tank of 11-gallon capacity has been placed between the front windows, in a position so that its faucet is directly above the sink. The tank is constructed so that it fits the walls exactly. It is filled by means of a pipe extending through the walls of the trailer.

On the right side of the trailer, between the side door and the forward storage cabinet, a desk suitable for writing or microscopic work has been constructed. Its top is continuous with the top of the forward storage cabinet on which the sink is located. Below the desk, on the left side, a microscope cabinet has been built in. Above the microscope cabinet are three shallow drawers which are suitable for carrying necessary instruments. The back of

---

2/ Christenson, L. D. A Berlese Funnel for Collecting Smaller Soil Animals. United States Department of Agriculture, Bureau of Entomology and Plant Quarantine, ET-81 (multigraphed), May 1936.

the desk is fastened directly to the wall of the trailer, and its outer corner is supported by a single leg.

In all of the cabinet work, $\frac{1}{4}$-inch ply wood with 1- by 1-inch framing was used, except that the top of the forward storage cabinet and the top of the desk were built with $\frac{3}{8}$-inch ply wood. This light material was used to keep down weight.

The trailer is pulled by a $\frac{1}{2}$-ton (pick-up) truck. The truck body is covered by a tarpaulin. In it a 2,500-watt, direct-current, fully automatic, electric power plant has been installed. The power plant furnishes current for operating the heating units in the Berlese funnels and for any other needs that may develop, such as the operation of power soil sifters.

This laboratory has been found, in practice, to furnish very satisfactory working conditions. At need, it can be taken directly to the field or orchard to be studied. In operation, however, it has been found best to locate the mobile unit at some suitable locally central point and bring soil samples from nearby fields to it.

A mobile laboratory of this type, in some instances, offers many advantages over those provided by a fixed laboratory. For the type of work such as the soil-insect survey for which the unit described in these pages was designed, it is almost indispensable. It could be replaced only by the establishment of permanent or semipermanent laboratories at a number of different points. Moreover, it permits timeliness of study. A mobile laboratory can be moved very quickly from place to place, and through its use investigational work can be well under way before it would be possible to set up a laboratory of the ordinary type. Finally, the mobile laboratory permits a more intimate contact between the investigator and the entomological problem in the field.

The essential features of the mobile laboratory herein described are illustrated in the photographs (figs. 1-8) reproduced herein. The approximate cost of the outfit, exclusive of movable equipment such as microscopes, is about as follows:

Trailer, with built-in features	$700.00
Truck	500.00
Power plant	500.00
Total	$1,700.00

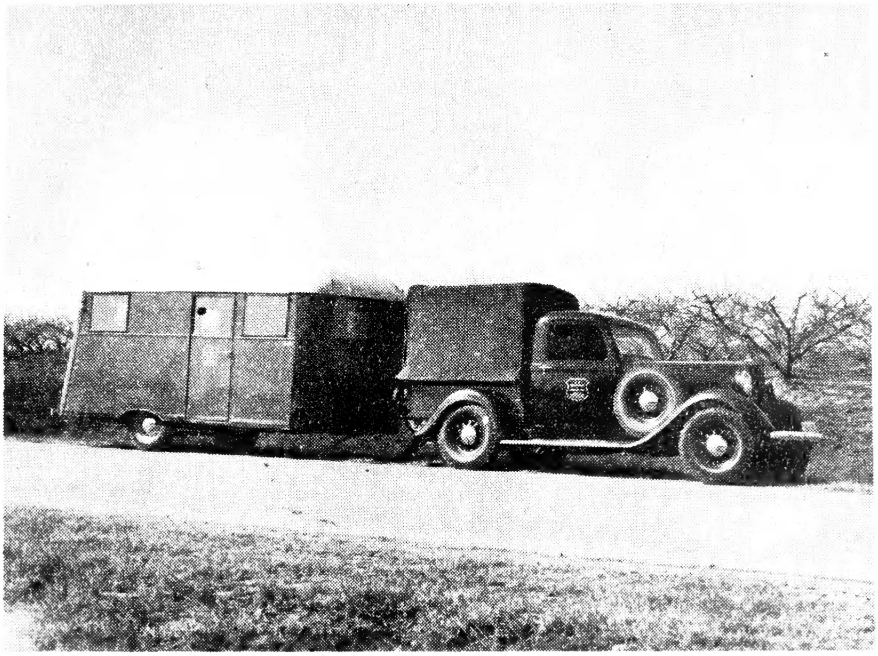

Figure 1.—Mobile laboratory in traveling condition.

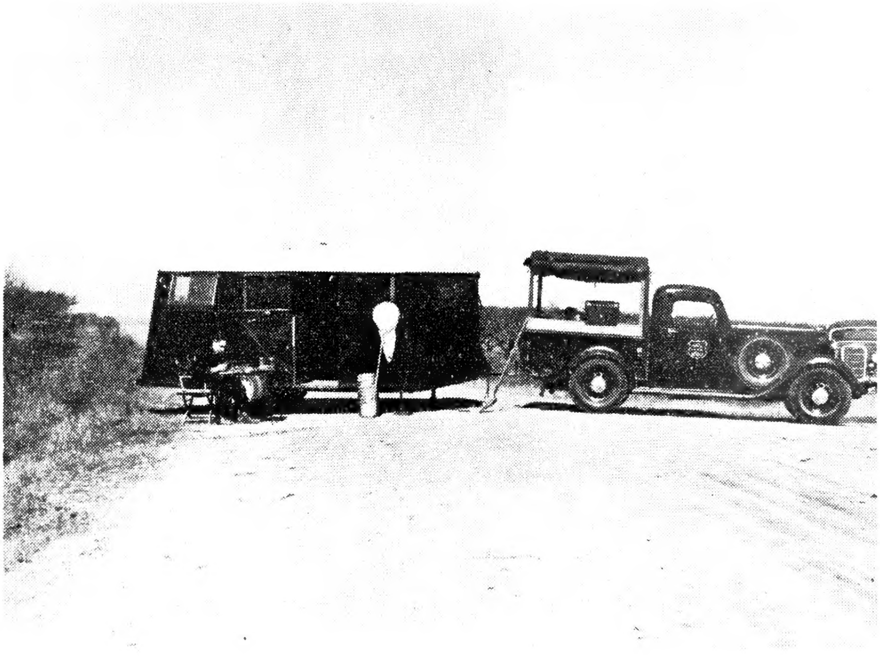

Figure 2.--Trailer laboratory set up and operating in open space in orchard. Trailer has been disconnected from truck and is supported by parking leg and extra jack.

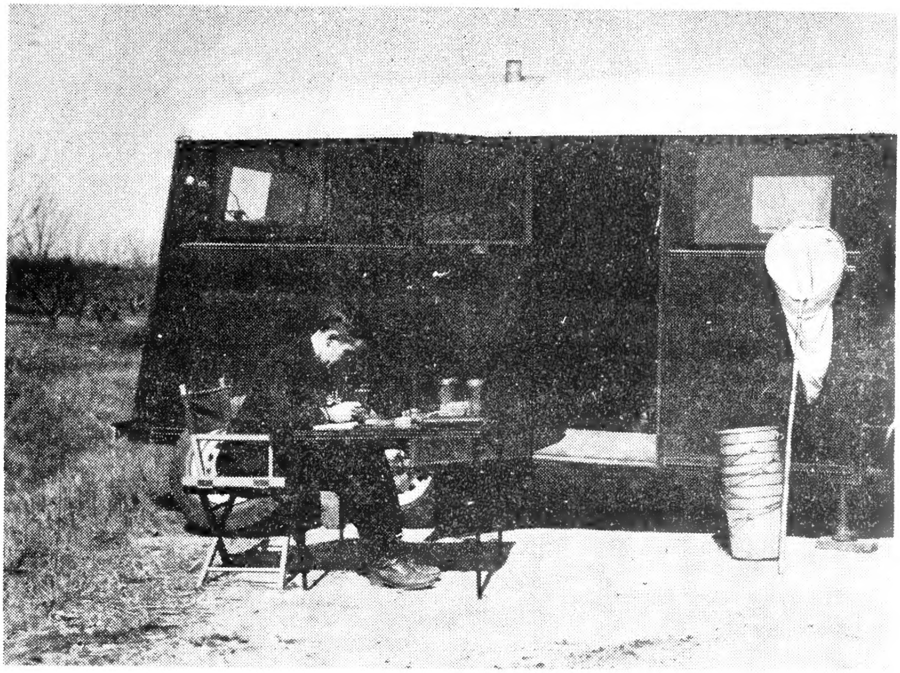

Figure 3.—Trailer laboratory parking in open space in orchard for operation. Portable camp chair and folding table permit work outside in fair weather.

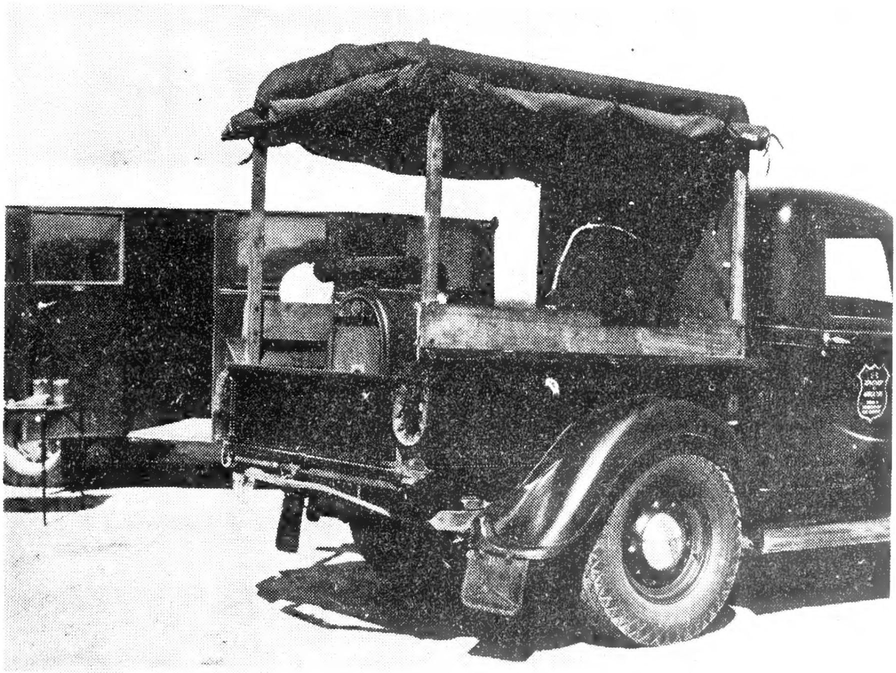

Figure 4.—Power unit mounted in ½-ton truck to furnish electric current for operating lights and equipment.

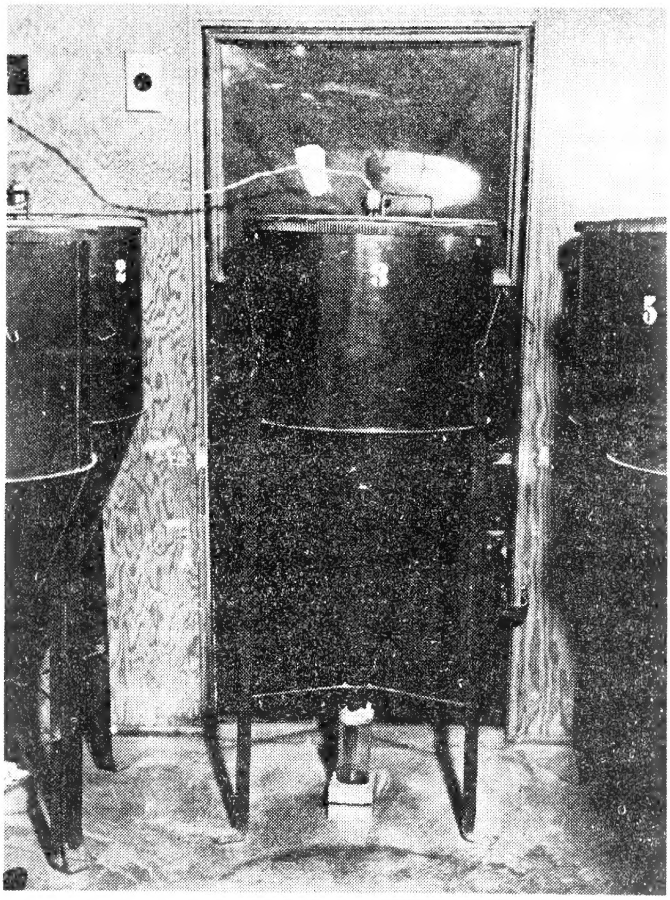

Figure 5.—Berlese funnels mounted in trailer laboratory for use in separating insects from soil.

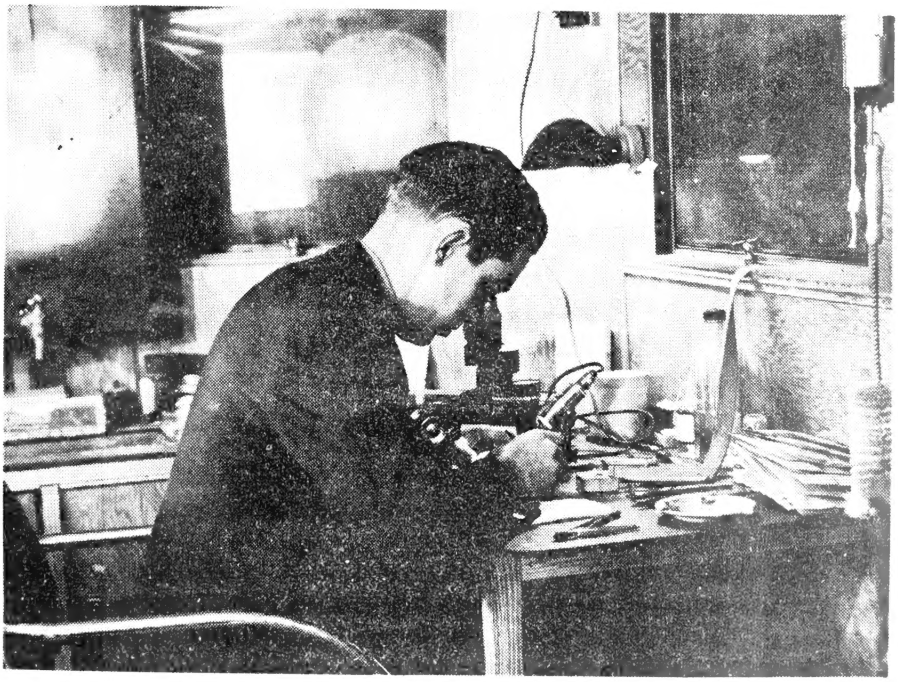

Figure 6.—Studying insects at laboratory desk in the traveling laboratory.

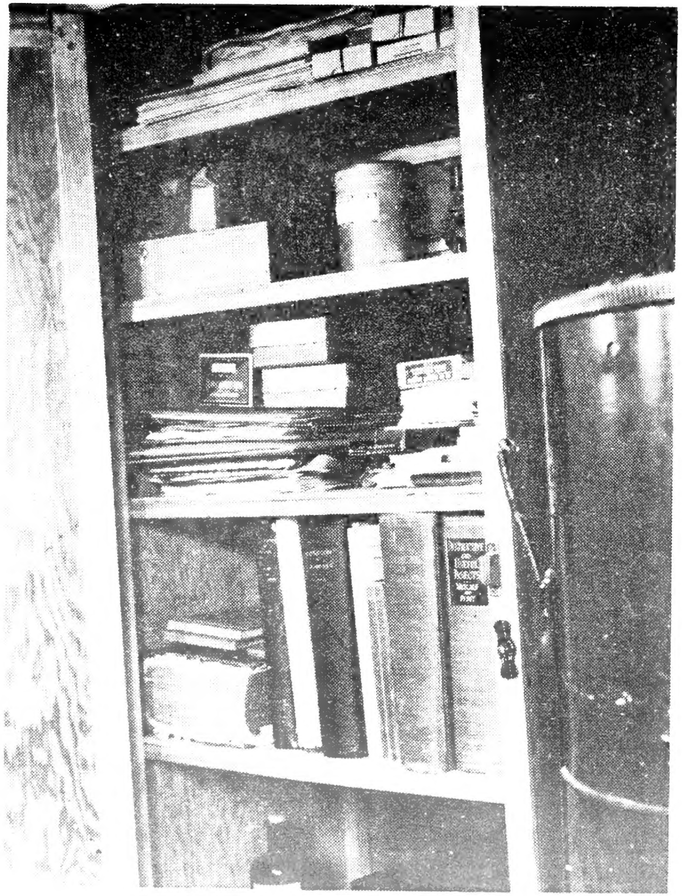

Figure 7.--Shelf closet used for books and supplies in trailer laboratory.

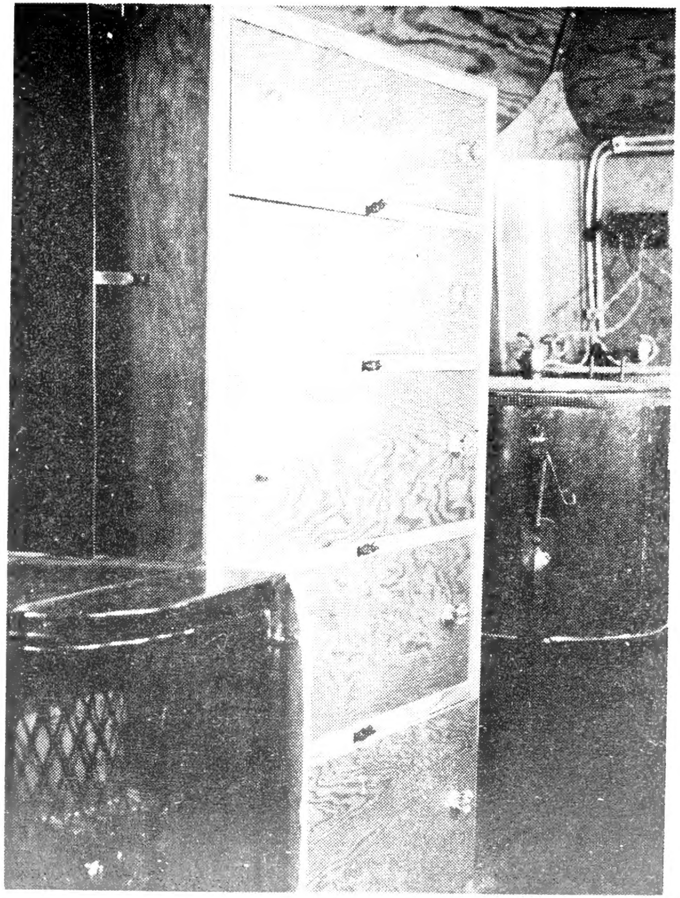

Figure 8.--Chest of drawers for carrying glassware and other supplies in trailer laboratory.